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ABSTRACT

The academic achievement of students in family and consumer sciences programs at High Schools That Work (HSTW) sites in 1996 was compared to performance levels in 1994. Family and consumer sciences students at HSTW sites significantly improved their average reading scores (from 261 in 1994 to 269 in 1996). The percentages of family and consumer science students meeting HSTW goals in reading and in mathematics increased from 1994 to 1996 (from 27% to 35% in reading and from 20% to 27% in mathematics). In reading and science, family and consumer students performed as well as vocational students nationally. The bad news is that the reading, mathematics, and science achievement of family and consumer sciences students at HSTW sites was significantly lower than that of all vocational students at HSTW sites. The following were among the recommendations presented: (1) set high expectations and get students to meet them; (2) offer intellectually challenging family and consumer sciences studies; (3) increase access to a college preparatory-level curriculum; (4) provide a structure of work-based and school based learning; (5) enable academic and vocational teachers to plan together; (6) involve students and parents in planning programs of study; (7) provide extra help; and (8) use student assessment to advance learning. (MN)

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HIGH SCHOOLS THAT WORK

Research Brief

Number 6 - June 1997

The 1996 *High Schools That Work* Assessment For Family and Consumer Sciences: Good News and Bad News

By Gene Bottoms

The 1996 *High Schools That Work* Assessment report contains good news and bad news for students completing a concentration in family and consumer sciences. Family and consumer sciences is a vocational concentration that includes instructional programs, services and activities aimed at preparing students for personal, family, community and career roles.

The report shows that efforts to improve achievement are paying off for students who are encouraged to complete a more demanding academic core. The good news is apparent in four ways:

1. ***HSTW* sites that participated in the assessment in 1994 and again in 1996 showed significant improvement in the average reading scores of family and consumer sciences students.** The reading scores increased from 261 to 269. Caucasian students pursuing a concentration in family and consumer sciences can read as well as Caucasian students at all *HSTW* sites.

2. **The percentage of family and consumer sciences students meeting *HSTW* goals in 1994 and 1996 increased from 27 percent to 35 percent in reading and from 20 percent to 27 percent in mathematics.** The science performance of these students declined slightly—from 23 percent to 21 percent. In contrast, at high-achieving schools with students of ethnic, racial and socioeconomic backgrounds similar to those of family and consumer sciences students at all sites, 55 percent of students met the reading goal, 63 percent met the mathematics goal and 46 percent met the science goal.

3. **In reading and science, family and consumer sciences students at *HSTW* sites performed as well as vocational students nationally.** In 1996, family and consumer sciences students at *HSTW* sites had an average reading score of 269, compared to 267 for vocational students in the national sample, and a science score of 270, compared to 267 for vocational students nationally. (See Figure 1.)

4. **There was a slight increase between 1994 and 1996 in the percentage of family and consumer sciences students who said their vocational teachers often stressed academic concepts.** A much larger percentage of students at high-achieving *HSTW* sites reported that their vocational teachers often stressed reading and mathematics concepts.

Figure 1

Comparison to 1996 Average National Achievement Scores

	Reading	Mathematics	Science
Family and Consumer Sciences Students - 1994	261	269	271
Family and Consumer Sciences - 1996	269	269	270
All Students - 1996	273	285	283
National Vocational Students	267	277	267

The proportion of minority and female students was larger in the family and consumer sciences area than in the total enrollment of vocational students at *HSTW* sites in 1996. Eighty-five percent of family and consumer sciences students were female, compared to 53 percent at all *HSTW* sites. Thirty-nine percent were minority, compared to 28 percent at all *HSTW* sites.

The bad news is that the reading, mathematics and science achievement of family and consumer sciences students at *HSTW* sites was significantly lower than that of all vocational students at all *HSTW* sites in 1996. (See Figure 1.) Also, the average achievement of both male and female family and consumer sciences students was significantly below the average achievement of male and female students at all *HSTW* sites. The average reading, mathematics and science achievement of family and consumer sciences students is significantly below that of other vocational students at all *HSTW* sites for both minority and majority students. Only 15 percent of family and consumer sciences students met *HSTW* performance goals in reading, mathematics and science compared with 26 percent of all vocational students. The 85 percent of family and consumer sciences students failing to meet these goals will be disadvantaged in pursuing further studies and finding a good job.

The hope lies in knowing what to do to correct the situation. Embedded in the assessment report given to each *HSTW* site, school leaders and teachers can learn how high-achieving schools and vocational programs are motivating more career-bound youth to meet the *HSTW* goals. Successful schools:

- **Set high expectations and get students to meet them.**

Family and consumer sciences graduates who were motivated by their vocational and academic teachers to complete challenging assignments both in and out of class had significantly higher reading and mathematics scores. Student achievement was higher if students did at least one hour of homework daily outside of class. More family and consumer sciences students (54 percent) reported having one-half hour or less of homework daily than did students from high-scoring sites (45 percent). Achievement also rose in reading, mathematics and science if students were encouraged by teachers and counselors to take more mathematics and science courses.

The bad news is that at least 54 percent of family and consumer sciences students are enrolled in academic and family and consumer sciences classes that accommodate their low expectations. These students make a passing grade by doing one-half hour or less of homework outside of class daily. Thirty-four percent of students who scored below the basic level in mathematics said they usually had no homework or did not do it, while 33 percent who scored below the basic level in science said they did not have homework or did not do it. Further, 57 percent of youth reported having no weekly homework assignment from a family and consumer sciences teacher.

- **Offer intellectually-challenging family and consumer sciences studies.**

The good news is that family and consumer sciences students who use reading, writing and mathematics to complete assignments have higher achievement in these areas.

Students who presented assignments to a family and consumer sciences class several times a year

Figure 2

Family and Consumer Sciences Students' Performance

Curriculum Level	Percent		Average Scores		*HSTW* Goals
	Family and Consumer Sciences	All Sites	Family and Consumer Sciences	All Sites	
High-Level English	27%	33%	276	281	Reading
Low-Level English	73%	67%	266	269	279
High-Level Mathematics	54%	64%	278	294	Mathematics
Low-Level Mathematics	46%	36%	258	270	295
High-Level Science	29%	39%	276	289	Science
Low-Level Science	71%	61%	268	279	292

and used computers to do assignments had higher reading scores, while those who used mathematics several times a year to complete family and consumer sciences assignments had higher average mathematics scores.

The bad news is that more than half of family and consumer sciences students who participated in the assessment at *HSTW* sites in 1996 were enrolled in family and consumer sciences courses that lacked challenging assignments and projects. Students were not required to apply mathematics in completing assignments, to seek technical information and organize it into procedures, to write critiques of their work, to make oral reports or to use computers. Family and consumer sciences courses that do not recognize these activities are not preparing today's youth for an information-centered economy. In fact, these courses are denying youth access to higher-paying jobs that require learning and thinking skills. Family and consumer sciences teachers can raise standards in their courses so that students have to work harder in and out of class.

- **Increase access to a college preparatory-level curriculum.**

The good news is that family and consumer sciences teachers made some progress—but less than teachers in other vocational areas—in the percentages of students taking higher-level English, mathematics and science courses. For example, 18 percent of family and consumer sciences students took college-preparatory English in the 12th grade and had an average reading score that exceeded the *HSTW* goal. This is compared to 56 percent of students at high-scoring *HSTW* sites who took college-preparatory English in their senior year. The percentage of family and consumer sciences students taking Algebra II increased from 29 percent in 1994 to 37 percent in 1996. Yet, at high-scoring *HSTW* sites, 73 percent of students finished Algebra II. The percentage of family and consumer sciences students completing college-preparatory biology and chemistry increased from 19 percent to 27 percent and from 30 percent to 35 percent respectively. Yet, for students at high-scoring schools, 69 percent completed chemistry and 55 percent completed college-preparatory biology. Family and consumer sciences students who took higher-level academic courses had significantly higher reading, mathematics and science scores than did those who took lower-level academic courses. (See Figure 2.)

The bad news is that family and consumer sciences teachers still face a major hurdle in enrolling more than 80 percent of their students in an English curriculum taught to college-preparatory standards. Students in a college-preparatory curriculum develop the ability to analyze situations, organize and synthesize written information and make written reports—skills that are critical to success in postsecondary education and good jobs.

Also under the heading of bad news, family and consumer sciences teachers have difficulty getting more of their students to enroll in higher-level mathematics and science courses and in getting those courses taught in ways that result in higher-level student achievement. At present, 46 percent of family and consumer sciences graduates fail to complete an upgraded mathematics core that meets *HSTW* criteria. The really bad news is that students who completed an upgraded mathematics core had average mathematics achievement 16 points below that of all vocational students who met the mathematics requirements at *HSTW* sites and 30 points below the 80-plus percent of students who had completed an upgraded mathematics curriculum at high-scoring sites.

Further bad news is that 71 percent of family and consumer sciences students failed to complete an upgraded science curriculum as recommended by *HSTW*. Yet, those who did, scored 13 points less in science than students who met the upgraded science core at all *HSTW* sites.

- **Have students complete a challenging program of study consisting of an upgraded academic core and a major. An upgraded core includes at least four years of college-preparatory English and three years each of mathematics and science, including at least two years in each area equivalent to courses taught in the college-preparatory curriculum. A major includes at least four Carnegie units in a broad technical field or further academic studies and two Carnegie units in related technical or academic courses.**

The good news is that family and consumer sciences students who completed the *HSTW*-recommended curriculum in all three areas—English, mathematics and science—had significantly higher reading, mathematics and science achieve-

ment than those who did not complete a high-level curriculum. In fact, in the 1996 assessment, students completing the recommended curriculum scored 14 points higher in reading, 27 points higher in mathematics and 14 points higher in science than students who completed a less-demanding program of studies.

The bad news is that 88 percent of family and consumer sciences students at *HSTW* sites did not complete an upgraded academic core and a career concentration. However, if 37 percent of family and consumer sciences students can complete Algebra II with fairly high averages, more of these students can also complete higher-level English and science courses.

■ Provide a structured system of work-based and school-based learning.

The good news is that 61 percent of family and consumer sciences students have jobs in the 12th grade. Working up to 20 hours a week is associated with reading, mathematics and science scores that are higher than those of students who do not work at all or work for more than 20 hours per week.

Certain work-site experiences are associated with higher-level reading, mathematics and science achievement. They include:

- Observing veteran workers;
- Being encouraged daily or weekly to build good customer relations.

The bad news is that too few students are reporting positive aspects of their work experiences:

- 3 of 10 students had jobs where they planned to work after high school.
- 4 of 10 said their jobs related to their family and consumer sciences studies.
- 3 of 10 received school credit for work experience.
- 2 of 10 said they rotated through several work assignments.
- 5 of 10 were encouraged daily or weekly to build good customer relations.
- 2 of 10 observed veteran workers.
- 4 of 10 were taught by someone at the work setting.
- 3 of 10 were encouraged frequently concerning their academic studies.
- 5 of 10 were frequently encouraged to develop good work habits.
- 3 of 10 were frequently shown how to use mathematics
- 3 of 10 were frequently taught new technical skills.

The bad news is that 3 of 10 students who receive school credit for family and consumer sciences work-based learning have lower reading, mathematics and science achievement than students who receive no credit. Two factors may contribute to this lower achievement:

(1) Students who receive school credit are more likely to work 21 hours or more per week.

(2) These students are much less likely to take mathematics or science courses in the 12th grade.

Hope lies in the fact that high school leaders, including family and consumer sciences teachers, can set high standards for awarding school credit for work-site learning. In doing so, they should:

- Award work-site credit only to students who are completing the *HSTW*-recommended curriculum;
- Require students to take four school-based credits in the 12th grade, including 3 credits in high-level academic courses.

■ Enable academic and vocational teachers to plan together.

The good news is that family and consumer sciences students at 15 *HSTW* sites participating in an advanced integration effort—giving academic and family and consumer sciences teachers time to participate in collaborative planning—made significant increases in reading, mathematics and science between 1993 and 1996. The scores increased from 265 to 277 in reading, from 265 to 280 in mathematics and from 254 to 274 in science. (See Figure 3.) It appears that collaboration between family and consumer sciences and core academic teachers to plan challenging and interdisciplinary learning activities for students can serve to accelerate learning and the quality of instruction in both academic and family and consumer sciences classes.

The bad news is that too many family and consumer sciences students reported that they had never had a joint assignment involving their family and consumer sciences courses and an academic class.

Figure 3

Improvement in the Achievement of Family and Consumer Sciences Students at *HSTW* Sites Doing Advanced Academic and Vocational Integration

	1996	1994	1993
Reading	277	258	265
Mathematics	280	268	265
Science	274	271	254

Fifty-nine percent of these students never had a joint writing assignment, 79 percent never had a joint mathematics assignment and 70 percent never had a joint science assignment in which they received a grade for two different classes. Yet, family and consumer sciences courses provide a rich context for students to see the inter-relationship of language arts, mathematics and science concepts.

Family and consumer sciences teachers can advance student achievement by giving demanding assignments that require students to use academic skills to complete challenging consumer-related projects, by taking the lead in engaging academic teachers to compare course goals and discover common goals, and by identifying significant projects that can serve as vehicles for teaching course goals.

■ **Actively engage each student in the learning process.**

The good news is that students learn more when they are doing challenging assignments. Activities associated with higher achievement include collecting, evaluating, organizing and presenting information, writing major research papers, doing short reflective writing assignments, making presentations on special mathematics projects, using mathematics to solve problems in vocational classes, using mathematics to solve authentic problems in the world of work, doing oral and written presentations in science, doing a science project on a community problem, and relating academic concepts to authentic problems beyond the school. The 1996 *HSTW* Assessment shows that these activities are associated with higher reading, mathematics and science achievement by family and consumer sciences students.

The bad news is that a lot of family and consumer sciences youth at *HSTW* sites do not remember having to complete many intellectually challenging assignments. For example, more than 50 percent of these youth said they never or seldom:

- Wrote a major research paper;
- Made a class presentation on a project or assignment;
- Used mathematics to solve actual problems in a vocational class;
- Completed a mathematics project that involved using mathematics to solve an authentic work-related problem;
- Made a presentation in class about a science project;
- Read an assigned book or article on science;
- Prepared a written report on a science subject.

Further, more than 70 percent of family and consumer sciences students said they never made a presentation in class about a special mathematics project. And more than 60 percent said they never used computers to complete a mathematics assignment.

Too many high schools offer too many levels of mathematics, science and English courses—levels such as college-preparatory, general, regular and basic. Family and consumer sciences teachers must urge their students to enroll in college-preparatory courses rather than courses that accommodate students to low expectations and little effort. By engaging students in difficult, authentic projects based on academic concepts, family and consumer sciences teachers can provide academic teachers with a meaning-oriented approach to instruction. One chemistry teacher said, "When I link science concepts to experiences in other classes, students see the need to learn and understand science."

■ **Involve each student and his/her parent or parents in planning a high school program of study.**

The good news is that the percentage of family and consumer sciences students planning to pursue further study increased from

54 percent in 1993 to 58 percent in 1996. The percentage of these students who reported that they received no help in planning a high school program of study—or simply did not have a plan—decreased from 41 percent in 1993 to 34 percent in 1996.

The bad news is that at least half of the students planning to continue their education were not prepared to do so. The quality of guidance services provided to family and consumer sciences youth did not improve very much between 1993 and 1996. More than one-third of these students in 1996 reported that they received no help in planning a program of study or that they simply did not have a plan. Only 22 percent said they met with their parents and a counselor or advisor to plan a program of study. Only 8 percent said a teacher advised them in the development of a four-year plan. This suggests that family and consumer sciences teachers are not getting students to think about post-high school goals and the types of academic and family and consumer sciences courses they need to take. Teachers and counselors are failing to help these youth and their parents understand what is required for successful transition into post-secondary studies or a primary job. Providing information to parents and youth and confronting youth with the realities of life are essential steps in improving the quality of learning for family and consumer sciences students.

■ Provide extra help.

The good news is that more than 60 percent of family and consumer sciences students at *HSTW* sites reported receiving extra help in reading from their English teachers, and over 80 percent reported receiving extra help from their mathematics teachers. Nineteen percent reported receiving extra help in reading from a special resource teacher, while 6 percent benefited from a tutor. In mathematics, 16 percent received help from a special resource teacher and 17 percent from a tutor.

The bad news is that only 30 percent of the students reported receiving extra help in reading and mathematics from their family and consumer sciences teachers. This may suggest that the level of assignments in family and consumer sciences classes is such that students are not required to draw upon their language arts and mathematics skills. Further bad news is that 22 percent of the students who scored below the basic reading level received no extra help in reading.

To meet the *HSTW* performance goals, more family and consumer sciences students will need special tutoring on specific concepts and skills. As family and consumer sciences teachers become advocates for their students to take higher-level courses, they must also become advocates for youth who need extra help to meet the more demanding standards.

■ Use student assessment to advance student learning.

The good news is that vocational teachers at *HSTW* sites make improvements when they use data on student achievement and instructional practices to change what is taught and what is expected. Family and consumer sciences teachers make progress in advancing students' learning when leaders and teachers work together to find and implement solutions to problems identified by the data.

The bad news is that family and consumer sciences students in too many high schools are the lowest-achieving of all vocational students. Yet, at high-achieving *HSTW* sites, family and consumer sciences students scored significantly higher in reading, mathematics and science than students at all sites. In the case of reading and mathematics, the average scores of students at high-achieving sites began to approximate the *HSTW* goals. (These high-achieving sites have students with racial and ethnic backgrounds similar to those of students at all sites.) High-achieving sites provide evidence that the reason family and consumer sciences students do not perform as well as students at all sites is due, in part, to the quality of school and classroom instruction in family and consumer sciences and academic courses. Family and consumer sciences teachers need to take the lead in meeting with the academic faculty to see what they can do together to advance the achievement of family and consumer sciences students.

Family and consumer sciences teachers can join with mathematics and science teachers to prepare a challenging mathematics and science exam that family and consumer sciences students must pass. Family and consumer sciences teachers can give the exam to students as many times as necessary. Such an exam can energize teachers and students toward a common

goal. The exam should reflect concepts and skills that students will need most to enter and advance in family and consumer sciences-related fields.

■ What can family and consumer sciences teachers do?

Family and consumer sciences teachers can:

- Carefully define the career concentration that students must complete in family and consumer sciences.
- Insist that students enrolled in a family and consumer sciences concentration complete the academic core advocated by *HSTW*.
- Prepare a syllabus for each family and consumer sciences course that defines course goals and standards students must meet.
- Require students to complete a major project during each grading period. These projects should become progressively challenging throughout the year. Design these projects to achieve course goals. Each project should require a major research paper, a product or service, and an oral presentation. When appropriate, link these projects to the work students are doing in English, mathematics and science courses.
- Become proactive in personal contacts with other teachers, students and parents so that family and consumer sciences students are taught an academic core that opens up vistas of opportunities rather than accommodates them to low performance.
- Require students completing a concentration of at least four Carnegie units in family and consumer sciences to complete a major senior project involving at least two other academic teachers—language arts, mathematics or science. This senior exhibition should consist of research on a significant topic in the student's area of concentration. It should be approved by the family and consumer sciences teacher and be written to the standards of the language arts teacher. The product or service should have at least a mathematics or science component, as well as significant technical content. It should require an oral presentation to teachers, community advisors and students.

SUMMARY

Rather than continuing to encourage students in their past low performance, the most progressive family and consumer sciences teachers are insisting that academic and family and consumer sciences courses teach students what they need to know to advance in further learning and work.

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